

15th Euro Global Summit on

Toxicology and Applied Pharmacology

July 02-04, 2018 | Berlin, Germany

Exposure to metals, multiple chemical sensitivity and neurogenic inflammation

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Toxic metals cause neurotoxicity, neurogenic inflammation, allergic sensitization, and T-cell autoreactivity. Of 118 patients with multiple chemical sensitivity (MCS), whole-blood levels of mercury, manganese, serum aluminum, and urinary arsenic were measured by ICP-MS (inductively coupled plasma mass spectrometry). We evaluated a cohort of 118 patients with multiple chemical sensitivity (MCS) associated with adverse reactions to metals. Mean (\pm SD) age was 48.1 (\pm 12.1), 103 were female (87.3%). In 40 patients (33.9%), mean concentrations in salivary mercury was 32.5 (\pm 41), toxic limit: 2.7 micrograms Hg per liter. In 43 patients of 118 (36.4%), mean serum aluminum levels were 6.2 (\pm 3.4) micrograms Al per liter (reference range, 6 to 9 micrograms Al per liter). In 35 patients of 118 (29.7 percent), urinary 24-hour arsenic excretion were elevated, 28.3 (\pm 47.7) micrograms As per liter (threshold limit, <10 micrograms As per liter). In 31 patients of 118 (26.3%), mean whole-blood manganese levels were 8.7 (\pm 3.9) micrograms Mn per liter (threshold limit, <7.7 micrograms Mn per liter). Allergy tests were performed in 60 patients (50.8%) by using skin patch testing and/or LTT in vitro test. 40 patients of 60 (66.7%) had nickel allergy; 28.3% had cadmium allergy; 25% had gold allergy; 23.3% had palladium allergy; 16.7% had cobalt allergy; 13.3% had chromium allergy; 43.3% had mercurials allergy (in aggregate). As compared with patients in the control group (no. 268), patients with MCS had significantly greater mercury levels in the whole blood. Thirty five patients of 118 (29.7%), showed 7.9 micrograms Hg per liter versus 268 patients of which 1238 (21.6%) showed 7.2 micrograms Hg per liter and significantly greater allergy to dental metals (86.6%, 52 of 60). Adrenal gland disorders were seen in three female patients (3 of 118, 2.5%). 9 patients had elevated serum prolactin level. Higher levels of mercury in biological indicators are associated with an increased risk of multiple chemical sensitivity.

Recent Publications:

1. Pigatto P D et al. (2013) Allergological and toxicological aspects in a multiple chemical sensitivity cohort. *Oxid. Med. Cell Longev.* 2013:356235.
2. Guzzi G et al. (2016) Multiple chemical sensitivity and toxic metals. *Toxicol. Lett.* 258(Suppl):s113.
3. Pigatto P et al. (2014) Serum zinc levels, allergy to metals, and multiple chemical sensitivity. *Contact Dermatitis.* 70:90.
4. Abou Donia M B, A Lieberman and L Curtis (2018) Neural autoantibodies in patients with neurological symptoms and histories of chemical/mold exposures. *Toxicol. Ind. Health* 34(1):44-53.
5. Stejskal V D et al. (1999) Metal-specific lymphocytes: biomarkers of sensitivity in man. *Neuro. Endocrinol. Lett.* 20(5):289-298.

Biography

Gianpaolo Guzzi is the President - Founder and Clinical Research Coordinator of the Italian Association for Metals and Biocompatibility Research – A.I.R.M.E.B., a Milan-based not-for-profit organization. His field of expertise is toxicology of mercury.

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